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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,030	03/30/2004	Alan E. Waltho	884.C49US1	7791
21186 7590 12/05/2007 SCHWEGMAN, LUNDBERG & WOESSNER, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			EXAMINER BAYARD, EMMANUEL	
			ART UNIT 2611	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/815,030	<b>Applicant(s)</b> WALTHO ET AL.	
	<b>Examiner</b> Emmanuel Bayard	<b>Art Unit</b> 2611	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☐ Claim(s) \_\_\_\_ is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                           |                                                                                        |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                               | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                      | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____                                                |

### DETAILED ACTION

This is in response to amendment filed on 9/28/07 in which claims 1-29 are pending. The applicant's arguments have been fully considered but they are moot based on the new ground of rejection.

#### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-10, and 12-27 rejected under 35 U.S.C. 102(e) as being anticipated by Moon U.S. Patent No 7,058,037 B1.

As per claims 1, 18 and 26, Moon teaches an apparatus, including: a digital processor to shift a digital baseband (see figs. 3 and 4 elements 100 and col.5, lines 60-65) signal upward along a frequency spectrum by a selected amount to provide a first elevated frequency digital baseband signal (see fig.4 element d) and a second elevated frequency digital baseband (see fig. element d') signal derived from a phase-shifted version (see fig.4 element b) of the digital baseband signal (see col.6, lines 5-67 and col.7, lines 5-30).

As per claim 2, Moon inherently teaches, wherein the selected amount is greater than 2 about a bandwidth of the digital baseband signal.

As per claim 3, Moon inherently teaches further including: a phase shifting module to receive the digital baseband signal and to provide the phase-shifted version of the digital baseband signal (see figs. 3-4 and col.6, lines 5-67 and col.7, lines 5-30

As per claim 4, Moon teaches further including a digital mixer (see fig.4 element d) to receive the digital baseband signal and to provide the first elevated frequency digital baseband signal.

As per claim 5, Moon teaches further including: a digital to analog converter to receive the first elevated frequency digital baseband signal and to provide an analog signal (see fig.3 element 104).

As per claim 6, Moon inherently teaches further including: a frequency converter (see fig.3 element 110 and having a SAW filter 112 and col.6, lines 39-55) is the same as the claimed (image reject mixer) to receive the analog signal and a carrier signal ( Note that, image rejected is well known in the art to be achieved by a SAW filter or band-pass filter).

As per claim 7, Moon inherently teaches further including: a filter to pass a non-rejected (see fig.4 element a) sideband signal provided by the image reject mixer.

As per claim 8, Moon inherently teaches, wherein the digital baseband signal is formatted according to an Institute of Electrical and Electronics 3 Engineers 802.11 standard.

As per claim 9, Moon teaches an apparatus, including: a first digital mixer to receive a digital baseband signal and to provide a first elevated frequency digital baseband signal (see fig.4 element d) a phase shifting module (see fig.4 element b) to receive the digital baseband signal and to provide a phase-shifted version of the digital baseband signal a second digital mixer to receive the phase-shifted version of the digital baseband signal and to provide a second elevated frequency digital baseband signal (see fig.4 element d' and col.6, lines 5-67 and col.7, lines 5-30) and a to digital analog converter to receive a selected one of the first elevated frequency digital baseband signal and the second elevated 11 frequency digital baseband signal and to provide an analog signal (see fig.3 element 104) to a frequency converter (see fig.3 element 110 and having a SAW filter 112 and col.6, lines 39-55) is the same as the claimed (image reject mixer) ( Note that, image rejected is well known in the art to be achieved by a SAW filter or band-pass filter).

As per claim 10, Moon teaches further including: a SAW (surface acoustic wave) filter to pass a non-rejected sideband signal provided by the image reject mixer (see fig.3 element 112 and col.6, lines 39-55).

As per claim 12, Moon teaches system, including: : a digital processor to shift a digital baseband (see figs. 3 and 4 elements 100 and col.5, lines 60-65)) signal upward along a frequency spectrum by a selected amount to provide a first elevated frequency digital baseband signal (see fig.4 element d) and a second elevated frequency digital baseband (see fig. element d') signal derived from a phase-shifted version (see fig.4 element b) of the digital baseband signal (see col.6, lines 5-67 and col.7, lines 5-30); an

omni directional antenna to transmit (see figs.3, 6 output of element 90 and col.6, lines 4-10)) communications signal derived from the first elevated frequency digital baseband signal.

As per claim 13, Moon inherently teaches, further including: display-to-display information associated with the digital baseband signal.

As per claim 14, Moon inherently teaches further including: a digital mixer to receive a selected one of the digital baseband signal (see fig.4 element d) and the phase-shifted version (see fig.4 element b) of the digital baseband signal and to provide the first elevated frequency digital baseband signal and the second elevated frequency digital baseband signal, respectively (see fig.4 element d').

As per claim 15, Moon inherently teaches, further including: a filter (see fig.3 element 112 and col.6, lines 39-55) to pass an analog signal provided by a digital to analog converter to receive a selected one of the first elevated frequency digital baseband signal and the second elevated frequency digital baseband signal.

As per claim 16, Moon inherently teaches wherein the omni directional antenna is included in a multiple-input, multiple-output communications system.

As per claim 17, Moon inherently teaches, wherein the communications signal is formatted 2 according to an Advanced Television Systems Committee (ATSC) standard.

As per claim 19, Moon inherently teaches, further including: mixing the digital baseband signal with a digital carrier frequency to provide the first elevated frequency digital baseband signal (see fig.4 element d).

As per claim 20, Moon inherently teaches further including: selecting a mixing technique from a Weaver technique and a Norgaard technique.

As per claim 21, Moon inherently teaches further including: mixing the phase-shifted version of the digital baseband signal with a digital carrier frequency to provide the second elevated frequency digital baseband signal (see fig.4 element d').

As per claim 22, Moon inherently teaches further including: converting a selected one of the first elevated frequency digital baseband signal and the second elevated frequency digital baseband to a first analog signal and a second analog signal, respectively (see fig.3 element 114).

As per claim 23, Moon inherently teaches further including: mixing the first analog signal and the second analog signal with a carrier frequency to provide an output signal (see fig.4 element d); and rejecting a resulting lower sideband signal from the output signal (see fig.3 element 112 and col.6, lines 39-55).

As per claim 24, Moon inherently teaches further including: processing the output signal to provide a vestigial sideband television signal.

As per claim 25, Moon inherently teaches further including: formatting the digital baseband signal according to an Institute of 3 Electrical and Electronics Engineers 802.11 standard.

As per claim 27, Moon inherently teaches converting the first elevated frequency digital baseband signal into a first analog sideband signal (see figs.3 and 4); and converting the second elevated frequency digital baseband signal into a second analog sideband signal (see figs 3 and 4).

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon U.S. Patent No 7,058,037 B1 in view of Dent U.S. Patent No 5,351,016

As per claim 11, Moon teaches all the features of the claimed invention except: an analog mixer to combine a synthesized carrier signal and a filtered sideband signal derived from a non-rejected sideband signal provided by the image reject mixer.

3. Dent teaches an analog mixer to combine a synthesized carrier signal and a filtered sideband signal derived from a non-rejected sideband signal provided by the image reject mixer (see fig.3 element 115 and 120 and col.13, lines 1-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Dent into Moon as to drive both the upconverter and the downconverter in order to permit correction of errors in post modulator components as taught by Dent (see col.13, lines 15-25).

As per claim 28, Moon teaches all the features of the claimed invention except combining the first analog sideband signal and the second analog sideband signal to provide a non-rejected sideband signal modulated by an analog carrier frequency.

Dent teaches a summer for (combining) the first analog sideband signal and the second analog sideband signal to provide a non-rejected sideband signal modulated by an analog carrier frequency (see fig.3 element 114).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Dent into Moon as to self adjusting the quadrature modulator using

numerical adjustments by adding offsets to achieve carrier balance as taught by Dent (see col.6, lines 5-12).

As per claim 29, Moon teaches all the features of the claimed invention except filtering the non-rejected sideband signal to provide a filtered sideband signal; and combining the filtered sideband signal with a synthesized carrier signal to provide a communications signal.

Dent teaches filtering the non-rejected sideband signal to provide a filtered sideband signal; and combining the filtered sideband signal with a synthesized carrier signal 6 to provide a communications signal (see fig.3 elements 115 and 120 and col.13, lines 1-25).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Dent into Moon as to permit correction of errors arising in post-modulator components as taught by Dent (col.13, lines 23-25)

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
5. Ocenasek et al U.S. Pub No 20040032912 A1 teaches a linearization of amplifiers.
6. Chiu U.S.Pub No 20050118963 A1 teaches a method and apparatus for I/Q imbalance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272

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3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM)

Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571 272 3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

11/30/2007

Emmanuel Bayard  
EMMANUEL BAYARD  
PRIMARY EXAMINER  
Art Unit 2611

